

REMARKS/ARGUMENTS

Favorable reconsideration of this application is respectfully requested.

Claims 1-3, 5, 6, and 31 are pending in this application. Claims 7 and 11-30 are canceled by the present response without prejudice, Claims 11-30 having been previously withdrawn from consideration as directed to a non-elected invention. Claims 1-3, 5-8, and 10 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent Application Publication 2003/0205815 to Chung. Claim 9 was rejected under 35 U.S.C. § 103(a) as unpatentable over Chung in view of U.S. patent 6,333,232 to Kunikiyo. Claim 31 was rejected under 35 U.S.C. § 103(a) as unpatentable over Chung.

Initially, applicant and applicants' representative wish to thank Examiner Mandala for the interview granted applicants' representative on April 20, 2005. During the interview the outstanding rejections were discussed in detail. Further, during the interview claim amendments were discussed to clarify the claims over the applied art. The present response sets forth the discussed claim amendments. Examiner Mandala tentatively agreed that such amended claims appear to address the outstanding rejections.

Addressing now the above-noted rejections in detail, those rejections are traversed by the present response.

Independent claim 1 is amended by the present response to clarify features recited therein. Specifically, independent claim 1 now recites a "barrier layer formed in the trench", and clarifies that the conductive layer is "formed within the barrier layer in the trench". Such subject matter is fully supported by the original specification for example in Figure 2A. As shown in Figure 2A, a barrier layer 40 is formed in a trench, and the conductive layer 50 is formed in the barrier layer in the trench. Such features are believed to distinguish the claims over the applied art.

The above-noted feature was similarly recited in previously pending dependent claim

7. With respect to that feature, the outstanding Office Action cited Chung at paragraph 104, lines 52-59.

In response to that position, applicants submit no teachings in Chung meet the above-noted claim limitations.

At paragraph [0104], lines 52-59, Chung discloses depositing a layer of a barrier metal on the “additional layer of *first dielectric*” (emphasis added). That is, Chung discloses forming a barrier layer on a dielectric layer, and does not teach or suggest forming a barrier layer within a trench. That is particularly the case as the noted portion in Chung at paragraph [0104], lines 52-59 is directed to Figure 3G in Chung. As clearly shown in Figure 3G in Chung the layer “metal” is already formed within the trench, and thereby clearly no barrier layer could be formed within the trench. Applicants also draw attention to Figures 5E and 5F in Chung that also disclose formation of barrier metals. As is also clear from those figures, Chung does not teach or suggest any structure in which a barrier metal is formed within a trench that also contains the layer labeled as “metal”.

Thus, Chung does not teach a structure such as shown in Figure 2A in the present specification in which a trench includes a barrier layer 40, and in which further a conductive layer 50 is formed within the trench and barrier layer 40.

Thus, the claims as currently written are believed to distinguish over the applied art to Chung.

Moreover, applicants respectfully submit Chung also does not teach or suggest the use of the insulating film “configured to prevent diffusion of a conductor material in the conductive layer”.

With respect to that feature, the outstanding rejection appears to refer to claim 10 and paragraph [0092], line 17 of Chung. However, in paragraph [0092], line 17, Chung only

describes a general material of organic and inorganic dielectrics. There is no disclosure therein in Chung of utilizing an insulating film that is configured to prevent diffusion of a conductor material in the conductive layer.

Moreover, claim 10 of Chung only discloses a structure of a barrier metal provided on an additional layer of a first dielectric material, again similarly as for example in Figures 5E and 5F of Chung. Such a barrier layer has no relation whatsoever to preventing diffusion of a conductor material, and clearly such a barrier metal does not prevent diffusion of the “metal” layer filed in the inorganic low-k dielectric, see for example Figures 5E and 5F in Chung.

Applicants further note it is only the applicants of the present invention that have recognized that utilizing a material of the claimed insulating film that can prevent a diffusion of a conductor is suitable in the claimed structure, see for example the present specification at page 7, lines 11-12. Chung does not disclose or suggest any such structure.

In such ways, the claims as currently written are believed to further distinguish over Chung.

Moreover, no teachings in Kunikiyo can overcome the above-noted deficiencies in Chung.

As no other issues are pending in this application, it is respectfully submitted that the present application is now in condition for allowance, and it is hereby respectfully requested that this case be passed to issue.

Respectfully submitted,

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